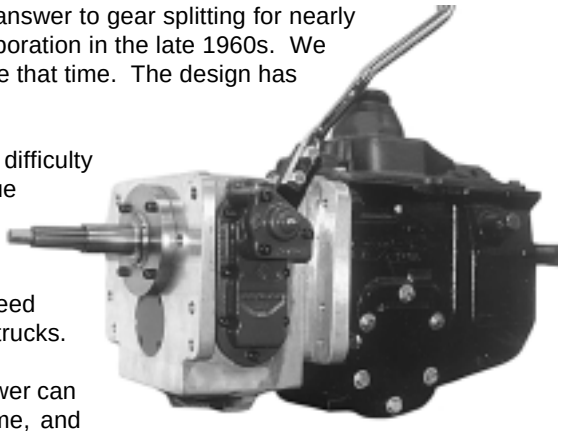
ADVANCE ADAPTERS INC.

P.O. Box 247, 4320 Aerotech Center Way
Paso Robles, CA 93447
Telephone: **(800) 350-2223** Fax: **(805) 238-4201**

P/N: RANGER OD

Page Rev. Date: 06-19-12



The Ranger Torque Splitter Two-Speed Overdrive has been the answer to gear splitting for nearly two decades. This unit was designed and developed by Warner Gear Corporation in the late 1960s. We purchased the unit in 1975, and have built hundreds of overdrive units since that time. The design has changed over the years, but the performance has stayed the same.

If you have a truck equipped with a 4 speed transmission and are having difficulty keeping the engine RPMs at peak range, then you need a Ranger Torque Splitter Overdrive. The Ranger simply provides a gear between each of your existing gears and converts your 4 speed to an "8 speed". When used as a gear splitter, you will be able to keep the engine RPM loss at a minimum, thus preventing the usual winding and lugging of the 4 speed transmission and engine. This works great for both diesel and gas pickup trucks.

With your engine coupled to the Ranger Torque Splitter Overdrive, your power can now be efficiently utilized with less engine wear, maintenance & downtime, and dramatically improve fuel economy. A typical example would be a Chevy truck with a V8 engine and a 4 speed transmission that has an engine RPM of 2500 when driving 60 m.p.h. in 4th gear. This same truck, when equipped with the Ranger Overdrive and traveling 60 m.p.h. in 4th gear overdrive will have an engine RPM of 1825. This is a drop of 27% in engine RPMs for the same highway speed.

The Ranger Torque Splitter Overdrive has been designed for maximum ease of installation and requires no special tools. The front of the Ranger simply bolts directly to your existing bellhousing. Your 4 speed transmission indexes directly into the back of the Ranger. You will be required to have your driveshaft shortened by your local driveline specialist. The Ranger is 7-1/2" long and will require the relocation of your 4 speed transmission shift lever.

The internal design of the Ranger Torque Splitter Overdrive consists of a T98 synchronizer coupled with precision helical cut gears. The gear assembly is mounted on roller & ball bearings that will provide a maximum torque range of 420 ft./lbs. Each unit is furnished with a shift control handle that has been designed for use in most pickup trucks. The splitting of gears does require shifting of both the stock 4 speed shift lever and the Ranger shift lever. The clutch must be used when shifting the unit.

RANGER II SPEED

The Ranger is currently available in only a **27% OVERDRIVE** ratio.

The Ranger is compatible with all manual transmissions whether in 2WD or 4WD. Since the location is ahead of the transmission and transfer case, the overdrive and gear splitting capabilities can be used in 4WD. The installation of the Ranger in your vehicle will not require the continual use of all eight forward gears. Depending on your requirements, you need not always use all eight gears. A good example would be when you are in city traffic where you may choose to use only four gears--*the choice is yours.*

Whether loaded or unloaded, on the highway or in the city, the Ranger offers you the opportunity for a great investment that makes your truck fit your driving requirements.

SPECIAL NOTE: The components packaged in this kit have been assembled and machined for specific type of conversions. Modifications to any of the components will void any possible warranty or return privileges. If you do not fully understand modifications or changes that will be required to complete your conversion, we strongly recommend that you contact our sales department for more information. This instruction sheet is only to be used for the assembly of Advance Adapter components. We recommend that a service manual pertaining to your vehicle be obtained for specific torque values, wiring diagrams and other related equipment. These manuals are normally available at automotive dealerships and parts stores.

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RANGER III MODELS & SPECIFICATIONS

CHEVROLET & GMC:

All GMC and Chevrolet manual transmissions have a bellhousing index hole of 4.686" or 5.125". Car-type transmissions and truck transmissions 1967 & earlier require the 4.686" index, while trucks 1968 to 1988, require the 5.125" index. The clutch spline on all GMC transmissions must be 1-1/8" 10 spline. In 1993, the New Venture 5 speeds required a special rear plate and bolt pattern requirements. Note: These units are only for the Chevy 4 speed transmissions and will bolt directly to the 4 speed and bellhousing with only minor modifications. Driveline and floorboard modifications are required.

Part No.	Description	Index Dia.
760001M-27	27% Overdrive Transmission	4.686"
760002M-27	27% Overdrive Transmission	5.125"

FORD MOTOR COMPANY:

All Ford manual transmissions have a bellhousing index hole of 4.848" or 5.125". The car-type transmissions and most truck-type transmissions have the 4.848" index size. There are a few early model trucks that have the 5.125" index. The input shaft clutch spline must be 1-1/16" 10 spline and have a minimum stickout length of 6-1/2". Note: These units are only for the Ford 4 speed transmissions and will bolt directly to the 4 speed and bellhousing with only minor modifications. Driveline and floorboard modifications are required. Note: We do not offer a 7-1/2"long input shaft option.

Part No.	Description	Index Dia.
760010M-27	27% Overdrive Transmission	5.125"
760014M-27	27% Overdrive Transmission	4.848"

TOYOTA LAND CRUISERS:

The use of the Ranger transmission in the Toyota Land Cruiser V8 Chevy engine conversions has become quite popular when being used with the stock Toyota 4 speed transmission. When used with a new V8 engine conversion, driveshaft modifications and special bellhousing adapters can be eliminated. Note: The earlier 3 speed Land Cruiser can be mated to the Ranger Torque Splitter by using a special retainer, P/N 716222, with Overdrive P/N 760001M-27.

Part No.	Description	Index Dia.
760024M-27	27% O.D. Trans-GM V8 Eng. to Toy L/C 4 Speed	5.125"

*FORD V8 UNITS AVAILABLE - Special Order

Special Note: The Ranger can be installed on 1987 and newer Land Cruisers. On these applications, we have found a few odd size input shaft bearings that Toyota used. In order to use our overdrive unit, the front input shaft bearing of your transmission must be measured. (This will verity what bearing index is necessary - a 3.544" diameter is standard). If your bearing diameter is 3.625", a special rear plate can be machined for this application.

SPECIFICATIONS:

Unit Weight	80 lbs.	Torque Capacity	420 ft./lbs
G.V.W. Rating	25,000 lbs.	Oil Capacity	1.65 quarts

RANGER TORQUE SPLITTER/OVERDRIVE ONE (1) YEAR LIMITED WARRANTY

The manufacturer warrants this product against material defects and faulty workmanship for a period of one (1) year from the time of shipment. We do not offer any type of labor allowance, and all warranty claims are subject to inspection by Advance Adapters. It is the customers responsibility to return possible warranted parts to Advance Adapters. The customer will be refunded for shipping costs incurred if the product is found faulty. We reserve the right to repair or replace any product. All returns must have a Return Goods Authorization Number (RGA#). Please call 1-800-350-2223, and our sales department can assist you. Warranty is void if proper gear lubricates are not used, the proper oil levels are not kept, the product has not been properly installed, and or installation instructions have not been followed.

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VEHICLE INSTALLATION PROCEDURES
CHEVY, GMC, FORD & TOYOTA L/C

INSTALLATION PROCEDURES:

READ THESE INSTRUCTIONS CAREFULLY BEFORE BEGINNING!

1. Disconnect the battery cable.

2. Unscrew the molding at one door so that the carpet or mat may be folded to the opposite side for access to the shifter.

3. Unscrew the boot and slide it upward for access to the top of the transmission. Remove the shift handle knob and shift lever boot for the transmission and (if a 4WD) the transfer case.

4. Remove the shift lever out of transmission by removing the stamped metal piece from the base of the stick. NOTE: Some models simply unscrew, while others come apart by pushing down and turning approximately 1/4" counterclockwise. On Borg Warner T18 transmissions found in some Ford products, it is necessary to remove a small pin in the left side so that it does not fall into the transmission.

5. Place a clean rag in the top of the transmission so that dirt does not get in during removal and reinstallation.

6. With the mat or carpet pulled to one side, remove the screw and bolts from the tunnel housing and detach it. (Greater accessibility can be gained by removal of the seat).

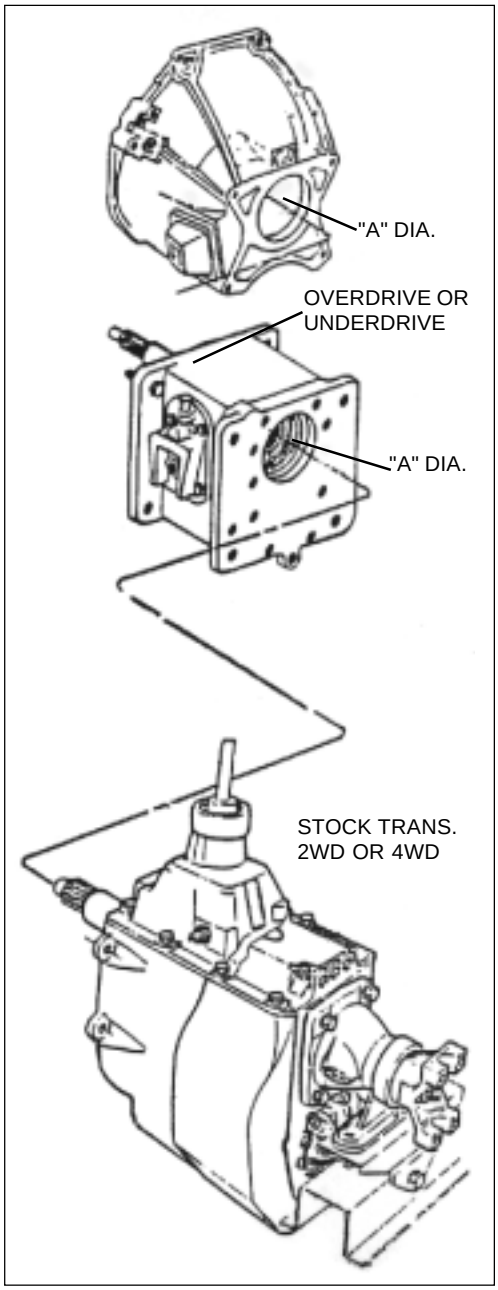
7. Jack up the vehicle and support solidly. Be sure to block any wheels remaining on the ground. CAUTION: Never go under a vehicle that is not solidly supported. Adequate jack stands are recommended. Before beginning work, always test a raised vehicle carefully to be certain there is no danger that the vehicle will fall.

8. Unbolt the U-Joints and remove the rear driveshaft (on 4WD vehicles, the front driveshaft must also be removed). The rear driveshaft must be shortened 7-1/2", and the front driveshaft must be lengthened respectively. (On Land Cruiser installations with a GM V8, no driveline modifcations are required).

9. Disconnect the speedometer cable. Because of the additional length of the Ranger, it may necessary to lengthen the speedometer cable. This may be accomplished in some cases by rerouting the cable. If that isn't possible, then it may be necessary to have a new cable made.

10. Disconnect the backup light switch wires and the 4WD indicator light wires on the transmission if your vehicle is so equipped. CAUTION: Before proceeding any further, determine if the rear of the engine is supported by mounts on the bellhousing or to the

STANDARD BELLHOUSING



SIMPLE INSTALLATION

transmission. On most models, the rear of the engine and transmission are supported by a crossmember bolted to the frame, and then to the transmission with a cushion between the crossmember and the transmission. It is essential that the rear of the engine be properly supported before proceeding.

11. When you are certain that the rear of the engine is firmly supported, remove the bolts in the crossmember and take it off.

12. Place a transmission jack under the transmission and secure it firmly to the transmission. CAUTION: Failure to secure the transmission to the jack, could result in serious bodily injury.

13. When the jack has been securely fastened to the transmission, remove the four bolts holding the transmission to the bellhousing.

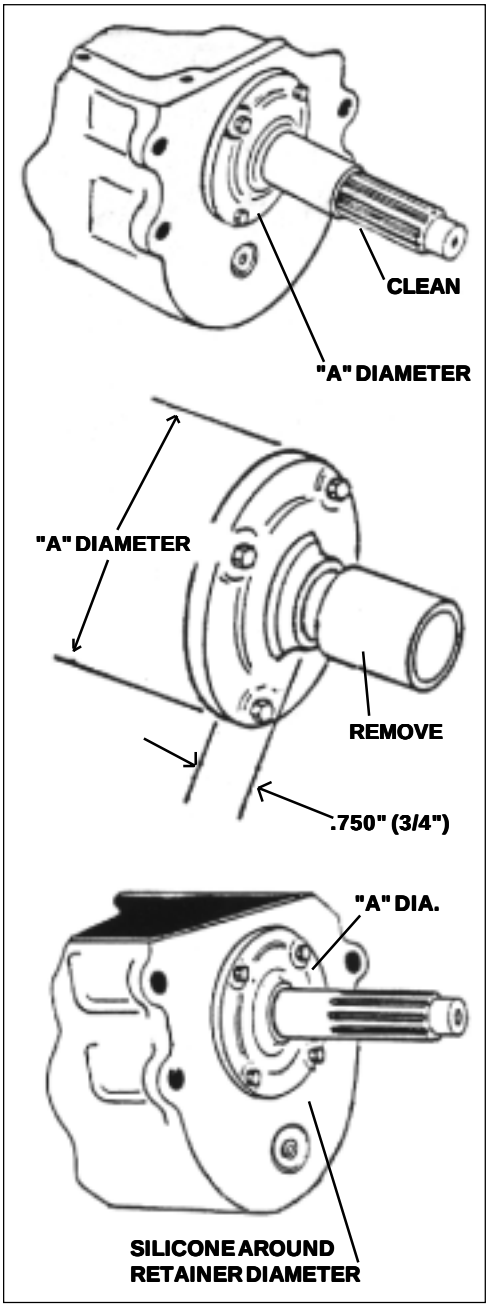
14. Remove the transmission. This is an excellent opportunity to check the condition of the clutch disc, pressure plate, throw-out bearing, and pilot bearing. Replace worn parts if necessary.

15. Clean the transmission input shaft thoroughly. Measure the opening in the bellhousing carefully, and then the outside diameter of the bearing retainer on the Ranger Overdrive. SEE THE ILLUSTRATIONS marked "A". If the bearing retainer size is smaller or larger then the opening in the bellhousing, please contact us toll free at 1-800-350-2223. Both bearing retainers must fit snugly for proper alignment of the transmission to the Ranger, and the Ranger to the bellhousing.

16. Remove the front bearing retainer on the original transmission carefully so as not to tear the gasket. Also, check the oil seal in the base of the retainer and replace it if necessary. (The oil seal is not supplied in the Ranger kit. The snout of the retainer must be cut off and the seal must be retained. The normal cutoff location is .750". However, we have had a customers require a longer length to retain the stock seal. Make sure you cut enough off so that the snout does not bottom out in the back of the Ranger.

Reinstall the retainer on the original transmission using the original gasket and bolts (without lock washers). Lock washers will raise the bolt head heights enough to cause severe damage and interference. We recommend that you use "BLUE LOCTITE" for the bolts in place of lock washers.

On Land Cruiser 4 speed installations, the Ranger uses the transmission front bearing for alignment. This step, as mentioned above, is not necessary. Simply remove the front retainer and clean the front of the transmission. On Land Cruiser 3 speed transmissions, our bearing retainer P/N 716222 and seal P/N 716719 should be used. The snout on this retainer must be shortened as list above.



CUT OFF BEARING RETAINER INSTALLED ON TRANSMISSION WITH SEAL STILL IN POSITION

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17. Fasten the Ranger securely to the transmission jack.

18. Bolt the Ranger unit into place using the bolts supplied. On some models, it may be necessary to modify the floorboard slightly to clear. The bolts on the left side of the unit will need to be started into the bellhousing before the unit will fit. NOTE: Do not suck unit up with the bolts.

19. Run a paper-thin layer of silicone sealer on the rear plate and next to the retainer to seal off any oil that might transfer between the two units. Without the silicone sealer, you will have oil leakage between the two units. The silicone must be wet while bolting the transmission to the overdrive. NOTE: An excess amount of silicone can cause misalignment of these units. This can cause the unit to pop out of gear, excessive wear, and ultimately will void the warranty.

20. Using the transmission jack, bolt the original transmission to the Ranger using the stock bolts.

21. With the transmission jack still in place, check the position of the rear crossmember (if you vehicle is so equipped). If the original transmission was supported by this crossmember, it will be necessary to reposition it on the frame 7-1/2" further back. The relocation is fairly simple on most applications.

22. Reinstall the rear crossmember and secure it firmly to the frame and transmission. CAUTION: Check all connections thoroughly before lowering the transmission jack. Failure to do so could result in bodily injury.

23. If it was necessary to remove the exhaust system, make all necessary modifications and reinstall. On some models, the emergency brake cables are supported by rods that hook to the crossmember. When the crossmember is relocated back 7-1/2", you should purchase a cable clamp to take up the excess slack.

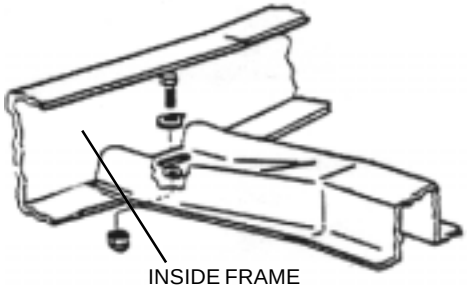
24. Now, reconnect the speed-o-meter cable and backup light switch wires and 4WD indicator light wires where applicable. 4WD models will possibly need the 4WD shift handle bracket modified. Ford and some Chevy vehicles will be able to use stock speed-o-cables.

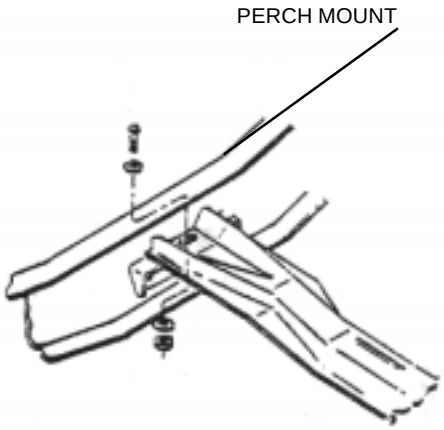
25. Reinstall the shortened drive shaft and be certain the bolts on the carrier bearing and the rear "U"-joint are tight. On 4WD vehicles, the new front driveshaft lengthened 7-1/2" is now reinstalled with special attention to tightening the bolts on the front differential and the transfer case flange.

26. Before the tunnel can be installed, it must be modified with either a sabre saw or air chisel. CAUTION: Use safety glasses to avoid injury while working with any of these power tools listed.

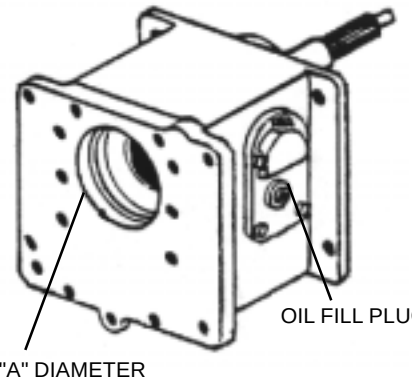
    Cut a new shifter hole approximately 7-1/2" from your main 4 speed. On manual shifter units, this will also be a good time to cut the hole for the chrome shifter handle. The hole for the handle on your Ranger should allow for mounting the boot screws to the tunnel or

TRANSMISSION OR TRANSFER CASE CROSSMEMBER SUPPORTS





REAR CROSSMEMBER VARIES IN DESIGN. THEY WILL REQUIRE RELOCATION 7-1/2" FURTHER BACK.

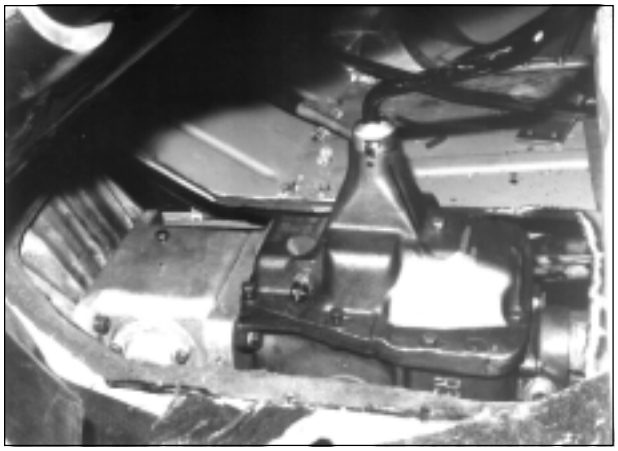


floorboards. The handle hole location can now be determined from the actual Ranger position. On 4WD vehicles, it will also be necessary to relocate the transfer case shifter hole, or extend linkage to fit new transfer case location.

27. Cover original transmission hole with sheet metal using sheet metal screws and silicone. Reinstall carpet or mat. You can use a piece of carpet from under your seat to cover your original transmission hole.

28. Install the original boot and screw it to the floorboard. (You may cover the original hole with a small piece of sheet metal. All cracks should be siliconed).

29. Remove the shift lever and reinstall the carpet or mat. At this point, you will have to make a new hole in the carpet or mat. The original hole can be patched from excess material beneath the seat.



Ranger Torque Splitter installed with a GM SM465 transmission.

30. Reinstall the 4 speed shift lever, the shift lever pin (if it was removed), the shift switch and wiring, and the shift knob.

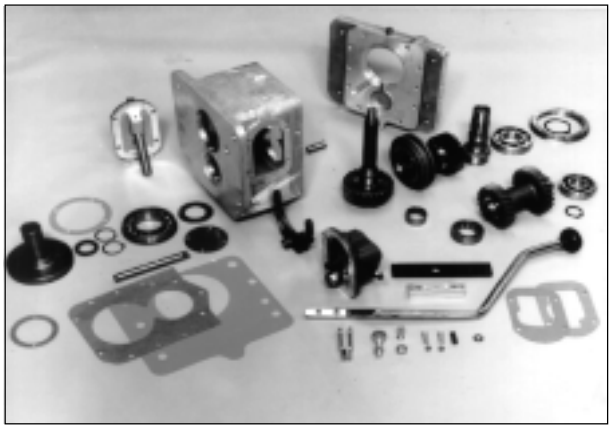
31. With the stock four-speed shifter handle installed and the original boot back in position, all that remains is the shifter handle for the Ranger Torque Splitter.

32. The handle can now be installed onto the handle bracket. There are two positions that the handle can be bolted to. The front two should be used when the handle needs to be further forward and the back two when the driver uses the seat in the back position. Use lock washers when bolting the handle to the bracket.

33. Advance Adapters recommends that a special break-in procedure be used for a period of 15 to 30 minutes prior to finalizing your installation. The Ranger Torque Splitter is a precision piece of equipment that has been assembled with precision bearing sand brass synchronizers. By using this simple break-in procedure, all of the gears and the bearings will be assured of maximum life. The procedure would be to simply install 1-1/2 quarts of regular 30 wt. motor oil and drive the vehicle for approximately 15-30 minutes. Drain the motor oil.

34. Refill the Ranger with a high performance gear synthetic lube (or equivalent). Viscosity rating on the oil (Mobile, Valvaline, Shell, etc.) should be SAE75W-90.
CAUTION: Failure to fill transmission and Ranger Torque Splitter with oil, will void all possible warranty claims. Double check your oil level!!

WARNING: To properly change gears, the clutch MUST BE DISENGAGED. Warranties will be voided on units shifted improperly.



Ranger Torque Splitter Assembly Kit

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Page Rev. Date: 06-19-12

RANGER TORQUE SPLITTER

PARTS LISTING

PART #	DESCRIPTION	Item#
761074	SHIFT FORK (New Style)	1
723705	3/8"-24 NF NUT	5
761028	SIDE COVER GASKET	7
761029	SPRING (Shift Fork)	8
761023	3/8" STEEL BALL (Ford & Cover)	9
761301	NEW STYLE RANGER III (5/88)	10
761307	SIDE COVER GASKET-RAN III	11
761302	SIDE COVER HANDLE CAP	12
761045	"O"-RING SEAL (Shift Rail Seal)	13
761124-A	FILL PLUG	15
723110	5/16"-18 x .75 S.H.C.S.	16
761044	SHIFT RAIL	17
723752	SET SCREW FOR SHIFT RAIL	18
761309	ZERK FITTING	20
761033	CHEVY & GM 5.125" DIA.	21
761037	4SP TOYOTA L/C 5.038" DIA.	21
761034	FORD 4.848" DIA.	21
761026	REAR PLATE GASKET	22
761005C	CHEVY & GM CASE	23
761005F	FORD CASE	23
761024	FRONT COVER GASKET	24
761064	FRT. LOW. BRG. COV. PLATE	25
720015	10"-24 x .375" LG. F.H.C.S.	26
761098	SEAL-C/R # 12363	27
761027	GASKET	28
761015	CHEVY & GM 4.686"	29
761016	CHEVY & GM 5.125"	29
761019	FORD 4.848"	29
723113	S.H.C.S. 5/16"-18 x 3/4"	30
723119	5/16"-18 NC x 1.25" H.H.C.S.	31
*761065	(discon't) DRIVE SLEEVE BUSHING	
761096	INPUT SHAFT BEARING (7/88) (BA-2212-ZOH-MFG-1K0)	32

***Note:** Units having a bushing will require the input shaft to be I.D. ground to fit the new roller bearing.

761053	CHEVY & GM SPLINE 1-1/8" 10	33
761054	FORD SPL. 1-1/16" 10 x 6-1/2"	33
761069	OIL SLINGER - BW #T90A-136A	34
761093	BEARING FOR INPUT SHAFT (BCA # N1308LOB)	35

PART #	DESCRIPTION	Item#
761083	SNAP RING	36
761081	SNAP RING	37
761092	BRG. FOR LOW. CLUSTER GEAR (BCA # 306L)	38
761102	27% O.D. CLUSTER GEAR	39
761091	FRT. BRG. FOR CLUSTER GEAR (BCA # M-1305GTV)	40
761085	SNAP RING	41
761090	REAR BRG. FOR DRIVE SLEEVE (BCA # 211SSL)	42
761103	STEEL BEARING RETAINER	43
761001	CHEVY/GM DRIVE SLEEVE 1-1/8" 10 (27% O.D. - 17% U.D.)	44
761002	FORD DRIVE SLEEVE (27% O.D. - 17% U.D.)	44
761052	27% O.D. GEARS - 23 TEETH	45
761070	COMPLETE SYNCHRO ASSY.	46
300372	SYNCHRO DOGS-HOLLOW (Ea.)	
300370	BRASS SYNCHRO RING (Ea.)	
300371	SLIDER RING	
300373	SYNC. DOG WIRE SPRINGS (Ea.)	
761070E	SYNCHRO HUB	
761084	SNAP RING	47
761124	INSPECTION COVER	48
761105	HANDLE	51
761073	SHIFT KNOB	52
723721	3/8"-16 NC x 1" LG. S.H.C.S.	64
723704	7/8" LOCK WASHER	65
723139	5/16"-18 NC x 1.50" LG. S.H.C.S.	67
761306	PIN BAR ASSEMBLY	68
761304	BALL DETENT BAR	69
761305	HANDLE MOUNTING SHAFT	70
761313	HEX NUT	72
761314	COTTER PIN	
761000	GASKET AND SEAL SET (Early)	
761000NS	GASKET AND SEAL SET (Ranger III)	

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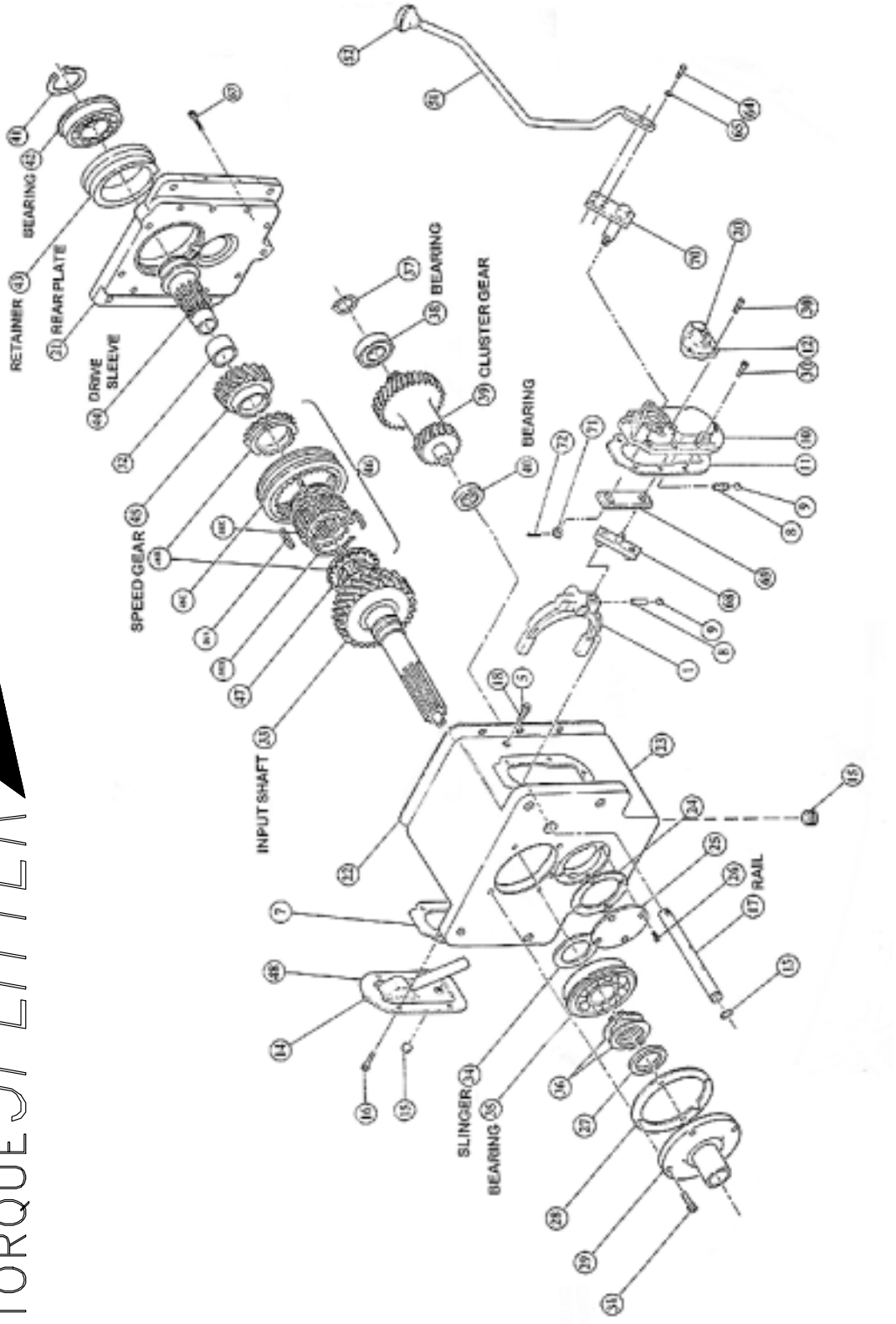
RANGER SPLITTER TORQUE



Ranger III - Components
1989 & UP

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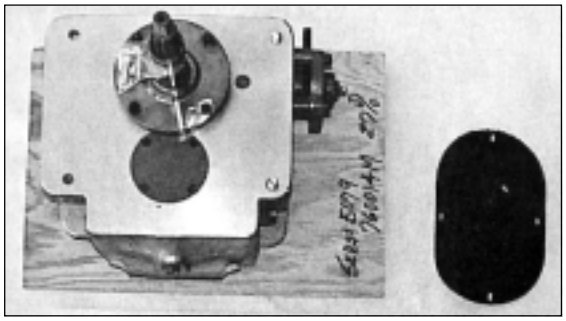
TWICE THE GEARS

INSTALLING ADVANCE ADAPTERS' TORQUE SPLITTER OVERDRIVE

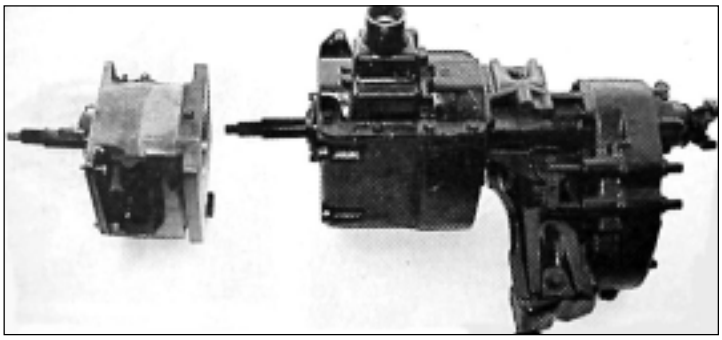
By Stuart Bourdon

Advance Adapters' Ranger Torque Splitter is a two-speed auxiliary transmission that, depending on your needs, can be ordered in either an overdrive or underdrive model. The overdrive unit will supply a 27-percent change in gearing, and the underdrive model offers a 17-percent shift. Don't let the name Ranger mislead you, this unit can be mounted on almost any manual transmission-equipped vehicle. Built inside an aluminum case, the Torque Splitter provides a four-speed vehicle with eight forward and two reverse gears. When four-wheel-drive is engaged, 16 forward and four reverse gears are available. The advantages offered by an auxiliary transmission such as this are numerous: the ability to have twice the gears to choose from while off-highway, extra-low gears to get a towed load such as a trailer rolling easier, and a set of gear ratios that keeps highway driving with tall tires and tall gears from being a gas-guzzling odyssey.

Disconnecting the vehicle's battery is always a good idea before beginning any aftermarket equipment installation, and the Torque Splitter's instructions suggests doing so. Remove both front seats and carpet for access to the transmission tunnel, and remove the gear levers. Remove the tunnel housing, and the transmission with a rag to keep dirt out during removal and reinstallation. Jack the vehicle up and solidly support it. Remove both driveshafts; the front shaft will have to be lengthened 7-1/2 inches, the rear shortened the same measurement and both shaft must be rebalanced.



1 The overdrive unit arrived bolted to a piece of plywood to protect it from damage during shipping.



2 The new overdrive and old transmission/transfer case package (previously removed as a set are shown aligned in the position they will be reinstalled. The Dana 20 transfer case was mated to the NP435 transmission using Advance Adapters' part #711114 adapter plate.

PHOTOGRAPHY: MICHAEL VANVAKARIS

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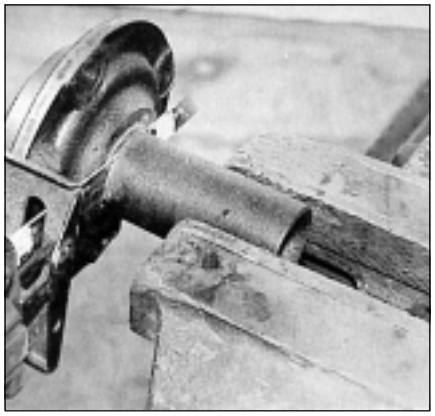
TWICE THE GEARS

Disconnect the speedometer cable, which, in some cases, must also be lengthened or rerouted to span the 7-1/2-inch rearward movement of the transmission created by installing the Torque Splitter.

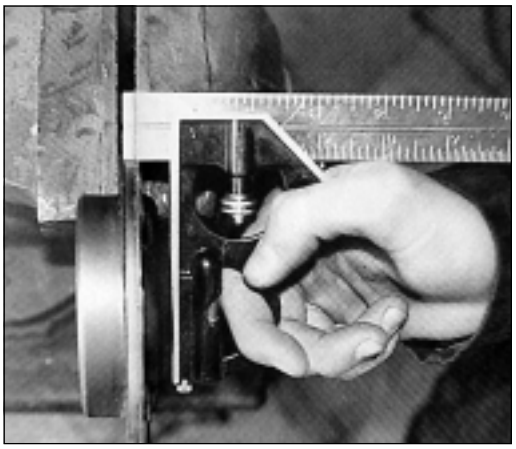
Advance Adapters recommends a 15- to 30-minute break-in period for the Torque Splitter before extended use. The break-in procedure suggested is to fill the unit with 1-1/2 quarts of regular 30-weight motor oil and drive the vehicle under light duty. Then drain the motor oil and refill the Torque Splitter with 1.65 quarts of

3 A hole was cut in the floorboard to make room for the overdrive shift lever and allow for the rearward (7-1/2 inch) displacement of the transmission/transfer case assembly and its two shift levers.



4 After carefully removing the front bearing retainer from the NP435 transmission so as not to tear the gasket (which must be reused), measure the retainer (from the back of the flange forward) and cut off all but 3/4-inch.

6 Silicone sealer was used around the edge of the retainer where it meets the transmission case so that oil would not pass between the transmission and the Torque Splitter.



5 Use a T-square to measure and scribe the cut line on the front bearing retainer. This measure must be accurate, because if the bearing retainer is more than 3/4-inch thick, the Torque Splitter will be damaged. The transmission front bearing retainer was then remounted to the transmission case using the original gasket and bolts, but without the lock washers, since the lock washers can raise bolt head heights enough to cause damage to the Torque Splitter. Use Blue Loctite in place of lock washers.

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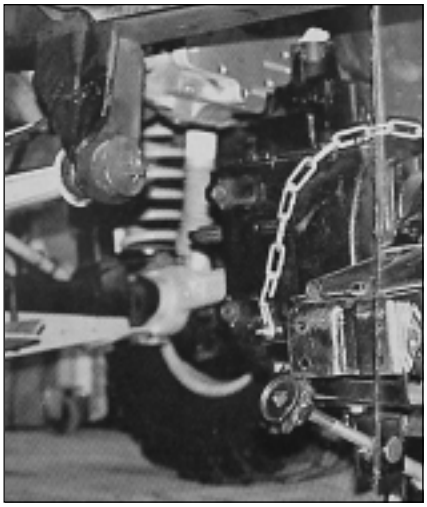
high-grade gear lubricant, such as SAE 75W-90.

Our installation shown here was performed on a '71 Ford Bronco featuring a NP435 four-speed manual transmission. You should read all installation and service instructions supplied by Advance Adapters *before* beginning installation.

7 *After the Torque Splitter was secured to a transmission jack, it was bolted into place on the bellhousing.*



8 *After fastening the transmission and transfer case to a transmission jack and securing the mass with a chain. The transmission is bolted to the Torque Spliter.*

9 *Because the Torque Splitter is mounted between the bellhousing and the transmission, the transmission is moved rearward 7-1/2 -inches upon reinstallation. Consequently, the rear powertrain crossmember supporting the transmission must move back the same distance. In this case, the stock crossmember brackets were welded to the frame at the new location, still allowing removal of the transmission for service by simply removing the bolts that go through the crossmember.*

10 *With the Torque Splitter, transmission and transfer case all in place, three shift levers protrude from the hole in the floor. The levers can be shortened to suit the driver, and after measuring the distance of full throw, forward and rearward, of the three levers, a sheetmetal transmission tunnel plate can be manufactured by a custom fabrication shop.*

SOURCES

used to compile this story

Advance Adapters, Inc., Dept. 4WOR, P.O. Box 247, Paso Robles, CA 93446, 805/238-7000

Michael's Welding & Design, Dept. 4WOR, 13625 Manhasset Rd. #1, Apple Valley, CA 92308, 619/240-0112

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